# List of Appendices

Gilson Seam - underlying this seam is interbedded sandstone, siltstone, shale, and coal riders of the Kenilworth Member.

Centennial Seam - underlying this seam is interbedded sandstone, siltstone, and shale, and coal riders of the Kenilworth Member.

Lower Sunnyside Seam - underlying this seam is barrier beach sandstone, the Lower Sunnyside Sandstone of the Sunnyside Member.

It should be noted however, that the immediate "floor" below the seams is sandstone in the case of the Lower Sunnyside and Aberdeen; and beneath the Gilson, and Centennial, siltstone.

**Pyritic Content (Laboratory Analyses)**

Complete analyses of these strata are included in Appendix E.

**Potential Alkalinity (Laboratory Analyses)**

Complete analyses of these strata are included in Appendix E.

**Clay Content (Laboratory Analyses)**

Complete analyses of these strata are included in Appendix E.

## R645-301-512.200. PLANS AND ENGINEERING DESIGNS

**Existing Structures**

All existing structures are situated on the Zion's fee land, on federal lease SL-027304, or on right-of-way UTU-62045 and are shown on Plate 6. There are no structures existing as part as Andalex's facility which were constructed prior to 1980. Originally it was anticipated that all buildings and structures were to be completed during the first five year permit term. Obviously this is not the case since the Aberdeen Mine has only recently been completely finished to this date. Plate 6 depicts the Aberdeen Mine with the surface facilities completed in early 1990. A new fan for the Aberdeen Mine will be constructed in the left fork of Deadman Canyon. Underground rock tunnels access the Centennial Seam. See 1.1, 2.1-1, 2.1-4.

Existing structures include the following:

| | |
|---|---|
| Bathhouse (5) | 14' x 60' |
| Mine Water Storage Tanks (3) | 12' x 16' |
| Warehouse (1) | 14' x 60' |
| Lamphouse (2) | 40' x 40' |
| Substations (2) | 60' x 100' |
| Office Building | 28' x 60' |
| Mine Fans (4) | 88" |
| Portals (15) | 6' x 20' |
| Culinary Water Tanks (3) | 12' x 10' |
| Shop | 80' x 120' |

All existing structures are situated on the Zion's fee land, on federal lease SL-027304, or on right-of-way UTU-62045 and are shown on Plate 6. There are no structures existing as part as Andalex's facility which were constructed prior to 1980. Plate 6 depicts the Aberdeen Mine with the surface facilities completed in early 1990. No new structures on the surface will be required to mine the Centennial and Aberdeen Seams on any lease including the new AEP Lease. Underground rock tunnels access the Centennial Seam. See 1.1, 2.1-1, 2.1-4. Existing structures include the following:

| | |
|---|---|
| Bathhouse (5) | 14' x 60' |
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| Mine Fans (4) | 88" |
| Portals (15) | 6' x 20' |
| Culinary Water Tanks (3) | 12' x 10' |
| Shop | 80' x 120' |

It should be noted that a new blowing ventilation fan and a new substation is proposed as shown on Plate 6. The fan will be a forced air fan and shaft to the Aberdeen Seam below. The fan will be located very close to the existing edge of the disturbance as shown on Plate 6. See Appendix Y for a complete description of the Ventilation Shaft/Blowing Fan Installation. The substation will be located near the Aberdeen Mine portals. See Plate 6.

Upon completion of mining activities, the portals will be sealed according to existing state and federal regulations and all buildings and structures not being utilized as part of the reclamation sequence, will be removed.

**R645-301-526.111. LOCATION**

See R645-301-110.

**R645-301-526.112. PLANS OR PHOTOGRAPHS**

See R645-301-110.

**R645-301-526.113. DATES OF CONSTRUCTION OF EXISTING STRUCTURES**

See R645-301-110.

**R645-301-526.114. MONITORING DATA**

N/A

It is very unlikely that a mine discharge will occur from any of the permanently sealed mine portals, although each seal will be equipped with a drainage pipe described above. To date, Andalex has encountered dry mining conditions and all portals in all three mines drift into the mountain in a down dip direction. If a discharge were to occur, it would only be after the entire pillared out workings had filled first. Then only would the static head against the seal allow any discharge. There is no way of knowing or estimating the mine discharge rate.

As maintained above, Andalex will monitor any discharge. Andalex's existing NPDES allows for a certain volume of mine discharge. This permit will be maintained after cessation of mining for the liability period until the bond is released.

The blowing fan ventilation shaft will be sealed by completely backfilling it from bottom to top. This shaft is 370' deep by 16' diameter, and will require approximately 2,755 cubic yards of backfill material. This backfill material will be hauled in from an offsite commercial gravel pit. See Appendix Y for reclamation information regarding the Ventilation Shaft/Blowing Fan Installation.

**Temporary Cessation**

Whenever it is known that operations are to be temporarily ceased for more than 30 days, Andalex Resources will submit to the Division a notice of intention to cease or abandon the operations, in accordance with MSHA standards.

This notice will describe mitigation measures to be employed in accordance with the terms and conditions of the permit approval, such as a statement of the number of surface areas involved in the cessation, extent of sub-surface strata, prior reclamation efforts accomplished on the property, and identification of all backfilling, regrading, revegation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

Temporary closing of underground workings will be accomplished with chain link fence material as recommended by MSHA. This prevents access by unauthorized individuals during idol periods. It is not anticipated that once Andalex reaches its peak production that this will occur.

If underground openings are to remain inactive for a period greater than 90 days, such openings will be temporarily closed off from access. Such closures will consist of a chain link or other substantial wire mesh fabric fence placed over the portals to prevent public access while allowing for air flow. Locked gates may be installed in the portal to allow for mine inspection.

**Casing and Sealing of Drill Holes**

All exploratory drill holes have been sealed with cement and all water wells have been cased with steel casing and will be

maintained. After mining is completed, the water wells and monitoring wells will be sealed except in the event the state engineer allows them to remain opened for other purposes.

**R645-301-529.200. UNDERGROUND MINING OPERATIONS**

**R645-301-529.210. TEMPORARILY INACTIVE OPERATIONS**

See R645-301-515.300.

**R645-301-529.220. RETURN UNDERGROUND DEVELOPMENT WASTE, COAL PROCESSING WASTE OR WATER TO UNDERGROUND WORKINGS**

See R645-301-515.300.

**R645-301-529.300. HOLES USED FOR BLASTING**

N/A

**R645-301-529.400. SURFACE MINING OPERATIONS**

N/A

**R645-301-530. OPERATIONAL DESIGN CRITERIA AND PLANS**

**Operation Plan: Existing Structures**

Construction and Design of Surface Facilities

**Existing Structures**

All existing structures are situated on the Zion's fee land, on federal lease SL-027304, or on right-of-way UTU-62045 and are shown on Plate 6. There are no structures existing as part as Andalex's facility which were constructed prior to 1980. Plate 6 depicts the Aberdeen Mine with the surface facilities completed in early 1990. No new structures on the surface will be required to mine the Centennial and Aberdeen Seams on any lease including the new AEP Lease. Underground rock tunnels access the Centennial Seam. See 1.1, 2.1-1, 2.1-4. Existing structures include the following:

| | |
|---|---|
| Bathhouse (5) | 14' x 60' |
| Mine Water Storage Tanks (3) | 12' x 16' |
| Warehouse (1) | 14' x 60' |
| Lamphouse (2) | 40' x 40' |
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| Mine Fans (4) | 88" |
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| Shop | 80' x 120' |

A new blowing ventilation fan and a new substation is proposed as shown on Plate 6. The fan will be a forced air fan and shaft to the Aberdeen Seam below. The fan will be located very close to the existing edge of the disturbance as shown on Plate 6. Refer to Appendix Y for additional information regarding this installation. The new substation will be located near the Aberdeen Mine portals. See Plate 6.

Upon completion of mining activities, the portals will be sealed according to existing state and federal regulations and all buildings and structures not being utilized as part of the reclamation sequence, will be removed, according to the Reclamation Plan.

**Construction Schedule**

All of the above structures have been completed, except the proposed new ventilation fan for the Aberdeen Mine. The earthwork for the Aberdeen Mine was completed in 1989. The surface facilities were in early 1990. Construction has been located and carried out so as to prevent and control erosion, siltation, water pollution, and damage to property. All facilities have been designed and constructed and will be maintained and used in a manner which prevents damage to wildlife and related environmental values. Any future construction will be conducted in a similar manner according to regulations regarding protection of the hydrologic system, etc. The rock tunnels for the Centennial Seam development were constructed in the spring of 1990 and completed late in 1990. As previously discussed this mining will require no new surface facilities.

Construction Methods
**Major Equipment**

The portal and building sites were leveled using dozers, trucks, and loaders. At the building sites, the topsoil was removed and transported to a nearby area for storage.

All surface pads have been graveled and all other disturbed areas (pond embankments, etc.) have been reseeded.

## R645-301-531. GENERAL

**Schedule of Construction, Mine Development, Mining and Reclamation**

All surface facilities have been constructed for the Pinnacle, Apex and Aberdeen Mines. Earthwork for the Aberdeen Mine was completed in 1989. The surface facilities for the Aberdeen Mine were completed in early 1990. No additional surface facilities are required for any new leases, however, as mentioned above, there is a proposed new ventilation fan for the Aberdeen Mine. There will be no additional construction activities or surface disturbance whatsoever in Hoffman Creek or Alrad Canyon.

However, Andalex does intend to add a fan installation in the left-hand fork of Deadman Canyon at some point in time. This

installation will be according to measures outlined by the Bureau of Land Management as part of Right-of-Way U-64158. (Copy of Right-of-Way is included in Appendix B.) Andalex will submit detailed plans for this installation at the appropriate time. The location of this breakout is shown on Plate 29 (R.O.W.).

Mining in the Gilson seam began in October, 1980 with a single unit's production. As mining progresses, additional units will be added with three production units and the longwall scheduled to be operating by mid-1994. A systematic mining plan will be followed to assure maximum recovery. All planning and scheduled production, however, will be contingent upon the coal market. Upon the conclusion of mining activities in the area, the scheduled reclamation phase will begin immediately.

Andalex will fill, regrade and stabilize rills and gullies over 9 inches in depth. Further, Andalex has agreed to interim stabilization of all slopes and embankments within the disturbed area and has done so. One slope located at the bottom of the office driveway, has been attempted through hydroseeding, fertilizing and mulching techniques on three separate occasions. No significant erosion problems have occurred, Andalex will notify the Division in the event of any slides or other damage immediately by telephone and in writing.

Andalex will cover acid or toxic forming materials if any are encountered.

Andalex will advise the Division in the event of a temporary shutdown, such as a letter sent to the Division when Andalex's Apex Mine was temporarily closed.

## R645-301-532. SEDIMENT CONTROL

See R645-301-512.240.

## R645-301-532.100. MINIMIZING DISTURBANCES

Surface disturbances are minimal due to the nature of the mining activities. The permit area has been previously impacted by mining. Surface disturbances will be limited to the existing facilities which have been constructed. The total existing surface area disturbed is 34.2 acres. Existing facilities are indicated on Plate 6 and 7.

The land affected by mining operations which shall be reclaimed, in compliance with the Mining and Reclamation Plan and all requirements of the Mined Land Reclamation Act and Rules and Regulations adopted in accordance therewith, can be described as follows:

34.2 acres located in T13S, R11E, S.L.B.&M., Carbon County, Utah and contained within,
SE 1/4 SW 1/4 Section 7
NE 1/4 SW 1/4 Section 7
SW 1/4 SE 1/4 Section 7
NW 1/4 SE 1/4 Section 7
SW 1/4 NE 1/4 Section 7

NE 1/4 NW 1/4 Section 18
NW 1/4 NE 1/4 Section 18

# Appendix Y

## Ventilation Shaft/Blowing Fan Installation

## Substation Installation

Ventilation Shaft/Blowing Fan Installation

In order to provide additional ventilation to the Aberdeen Mine, a new ventilation shaft and a blowing fan will be installed north of the existing shop within the previously disturbed area. This new fan will require a vertical ventilation shaft constructed from the surface down to the Aberdeen mine workings. This will be accomplished using a raise-bore machine at the surface pulling a boring head up through a pre-drilled pilot hole. A site has been selected for the fan which will be located next to the shop building near the cut-slope within the existing disturbed area of the Tower minesite. An exploratory test hole has been dug in the yard to verify the foundation structure for the fan. (The concrete collar for the fan, as it sits over the shaft, must be on solid bedrock in order to support the raise-bore operation). A suitable shelf of bedrock is located about 15' below the existing pad surface which looks promising for anchoring the shaft collar.

The following fast-track schedule is proposed:

Complete the site preparation by excavating the remainder of the bedrock shelf area in preparation for the construction crews within the next 10 days.....10 days to drill the pilot hole.....one week to construct the concrete collar (20' diameter, 16' high, 18" thick walls).....one week for the concrete to cure.....one week to backfill the excavated area around the collar. At this point the raise bore machine can mobilize onto the completed collar and begin raise-boring the shaft. (The cutting head for the raise bore will already be positioned in the underground mine workings in preparation).....30 days to ream out the shaft (16' diameter, 370' total depth). All muck material from the excavation will fall back into the mine as is being cut and will be disposed of in the underground workings.....two weeks to install the vent fan and put it into operation. By starting earthwork construction by this week, we could have the additional ventilation capabilities by Christmas.

This construction will be entirely within the existing disturbed area, in other words there will be no new surface disturbance. There will be no change to the hydrologic design. The existing power line that once served the Apex mine, will be utilized so no new power distribution facilities will be required. All the excavated material will be replaced after the collar is constructed by backfilling around the collar. During construction care will be taken to not place any material in any designated drainage ditches.

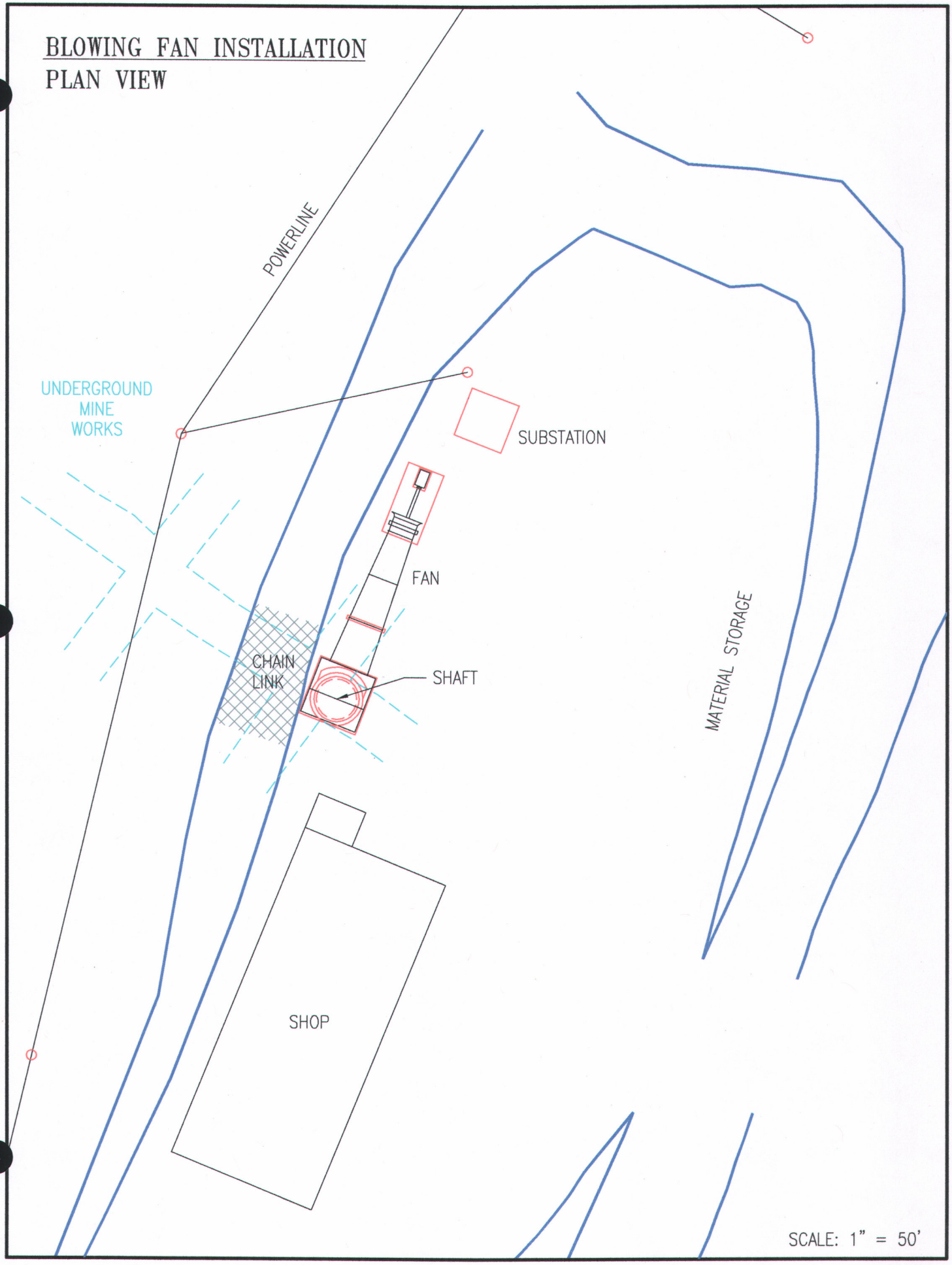
Estimated bonding requirements for reclamation is as follows:

| | | |
|---|---|---|
| A. | Backfill the shaft | 2,755 cu.yds. |
| B. | Concrete Demolition | |
| | Collar | 105 yds. |
| | Collar Pad | 19 yds. |
| | Fan Base | 100 yds. |
| | Motor Base | 8 yds. |
| | Transformer Pad | 10 yds. |
| C. | Fan Steel Demolition | 5 tons |
| D. | Substation Demolition | 2 tons |

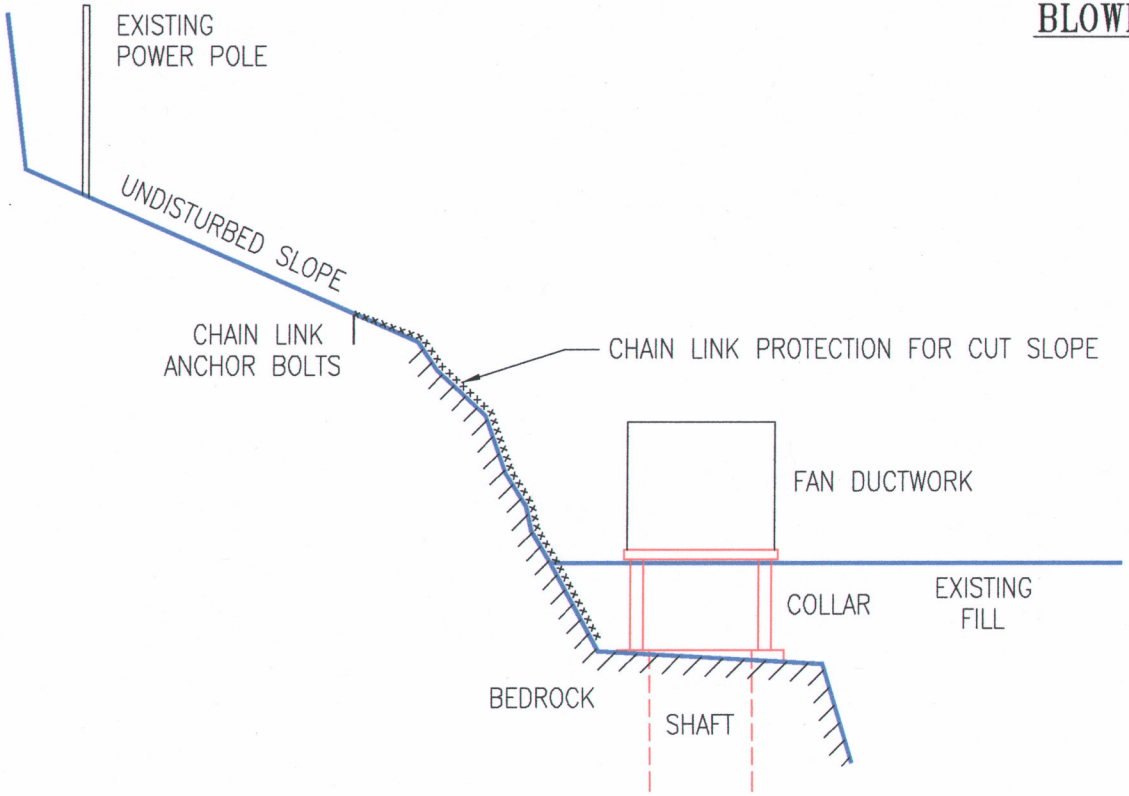
Substation

In order to meet the increasing power needs in the Aberdeen Mine, a new substation will be constructed. This substation will be located adjacent to the existing Aberdeen Mine intake portals. The substation will contain a 46 KV/12.5 KV transformer and switch gear. These components will be mounted on a concrete pad. All components will be enclosed within an 8' high chain link fence. Secondary power from the substation will be routed to the mine through buried electrical conduits. The primary feed to the substation will tap off of the existing 46 KV powerline which runs through the mineyard. All construction associated with the substation installation will be within the previously disturbed area. The total footprint of the substation will not exceed 60' x 100'. The installation will be very similar to the existing substation (although somewhat smaller) which will continue in operation. For bonding purposes the reclamation cost for the new substation should be similar to the existing substation.

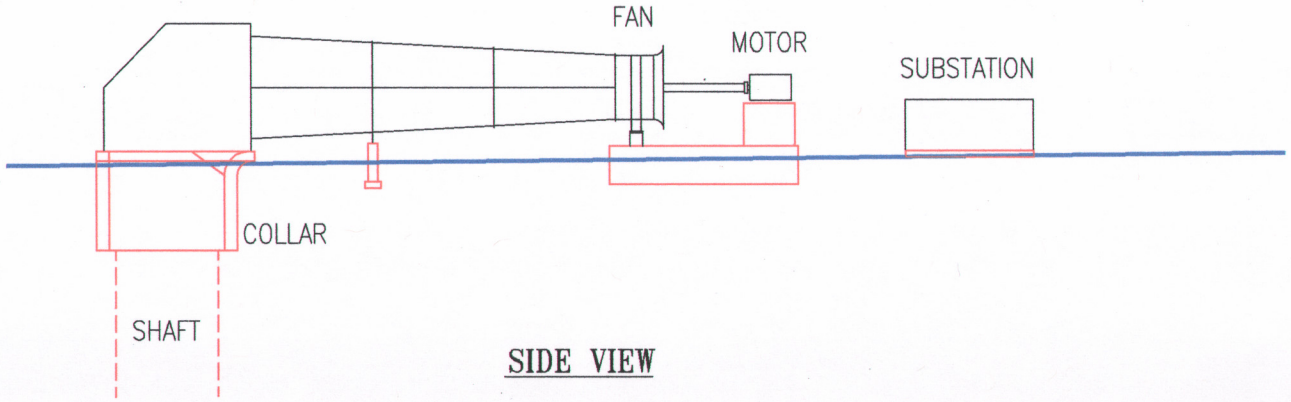
# BLOWING FAN INSTALLATION
## PLAN VIEW



# BLOWING FAN INSTALLATION




END VIEW (PROFILE)




SIDE VIEW

SCALE: 1" = 30'